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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/511,734	10/18/2004	Davor Protic	046972-0102	2536

22428 7590 03/28/2007  
FOLEY AND LARDNER LLP  
SUITE 500  
3000 K STREET NW  
WASHINGTON, DC 20007

EXAMINER
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LEE, SHUN K

ART UNIT	PAPER NUMBER
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2884

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/28/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/511,734

Applicant(s)

PROTIC ET AL.

Examiner

Shun Lee

Art Unit

2884

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 3-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 January 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***National Stage Application***

#### ***Drawings***

1. The drawings were received on 5 January 2007. These drawings are acceptable.

#### ***Specification***

2. The disclosure is objected to because of the following informalities: "grooves 5" in line 3 on pg. 9 (and in line 6 on pg. 10) should probably be --grooves-- (37 CFR 1.437 and PCT Rule 11.13(m)). Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 8 and 12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Amended dependent claim 8 recites the limitation "wherein the amorphous layer is not doped". Applicant argues that support for this amendment may be found at pg. 6, line 11 to pg. 7, line 10. The specification states (pg. 6, line 11 to pg. 7, line 10) that "Very good results have been achieved with an amorphous layer made of germanium. ... The crystalline region

beneath the amorphous layer then preferably also consists of germanium. ... The amorphous layer is always applied to a semiconductor material. The amorphous layer therefore provides an electrical conductivity, which is substantially smaller than the conductivity of the material disposed beneath the amorphous layer. In one exemplary embodiment for the manufacture of the invention, an amorphous germanium layer is initially applied by sputtering or vapour deposition. ... Grooves are etched in the amorphous germanium-metallic layer to such a depth that they extend at least into the germanium crystal region. These grooves advantageously extend into the germanium crystal. The opposing contact (p<sup>+</sup>) has already been produced on the opposite side by doping with boron and subsequent microstructuring". Thus there is no express disclosure in the application as filed that the amorphous layer is not doped. While there is no *in haec verba* requirement, newly added claim limitations must be supported in the specification through express, implicit, or inherent disclosure (MPEP § 2163). Further, the passage cited by applicant as support for the newly added claim limitation also does not appear to contain an implicit or inherent disclosure that the amorphous layer is not doped. Therefore, the newly added claim limitation was not described in the specification as filed.

New independent claim 12 recites the limitation "disposing on the substrate an amorphous Gallium layer". Applicant argues that support for this amendment may be found at pg. 6, line 25 to pg. 7, line 10. Thus there is no express disclosure in the application as filed that the amorphous layer is gallium. While there is no *in haec verba* requirement, newly added claim limitations must be supported in the specification through express, implicit, or inherent disclosure (MPEP § 2163). Further, the passage cited by applicant as support for the newly added claim limitation also does not appear

to contain an implicit or inherent disclosure that the amorphous layer is gallium.

Therefore, the newly added claim limitation was not described in the specification as filed.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1 and 3-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamacher *et al.* (Performance of position -sensitive germanium detectors in nuclear reaction experiments, Nuclear Instruments & Methods in Physics Research, Vol. A295, no. 1-2 (October 1990), pp. 128-132) in view of Luke *et al.* (Amorphous Ge bipolar blocking contacts on Ge detectors, IEEE Transactions on Nuclear Science, Vol. 39, no. 4 (August 1992), pp. 590-594).

In regard to claims **1**, **3-5**, **7**, and **8**, Hamacher *et al.* disclose (Fig. 1) a camera with a position-sensitive detector for measuring charged particles comprising a crystalline substrate formed of semiconductor material (e.g., high-purity germanium) and a surface region, the surface region comprising blocking contacts (formed by boron ion implantation) with a structured, metallic layer comprises Al (aluminum) disposed above it, wherein the structure of the metallic layer continues through the blocking contacts and at least partially into the crystalline substrate (see "transferring the structure into the semiconductor material by etching" in Fig. 1). The detector of Hamacher *et al.* lacks that the blocking contacts comprise a germanium (or silicon) amorphous layer disposed on the crystalline structure, wherein the amorphous layer is not doped. Luke *et al.* teach (section 1) to apply an undoped germanium amorphous layer on a p- or n-doped germanium crystalline semiconductor structure, in order to obtain good bipolar blocking contacts. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide an undoped amorphous germanium layer instead of the boron doped layer in the detector of Hamacher *et al.*, in order to obtain good bipolar blocking contacts.

In regard to claim **6** which is dependent on claim 1, Hamacher *et al.* also disclose (section 3.1, last paragraph on the right column on pg. 129) that the structure is formed from segments having a mutual spacing of less than 100  $\mu\text{m}$ .

In regard to claim **9** which is dependent on claim 1, Hamacher *et al.* in view of Luke *et al.* is applied as in claim 1.

It is noted that claim 9 recites that the camera is a tomograph or compton camera which appears to be mere statements of purpose or use and does not appear to imply any additional structural limitations of the camera with a position-sensitive detector as recited in claim 1. Applicant is advised that should claim 1 be found allowable, claim 9 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

In regard to claims **10** and **11** which are dependent on claim 6, Hamacher *et al.* also disclose (section 3.1, last paragraph on the right column on pg. 129) that the mutual spacing is less than 100  $\mu\text{m}$  (e.g., less than 20  $\mu\text{m}$ ).

### ***Response to Arguments***

8. Applicant's arguments filed 5 January 2007 have been fully considered but they are not persuasive.

Applicant argues (remarks filed 5 January 2007) that there is no motivation to combine since the a-Ge layer acts as a passivation layer which should not be structured. Examiner respectfully disagrees. Applicant's argument rests on the assumption that a passivation layer is always desirable. First, in the passage cited by applicant (Hansen *et al.* Protective surface coatings on semiconductor nuclear radiation detectors, IEEE Transactions on Nuclear Science, Vol. NS-27, no. 1 (1980) pp. 247-251), it should be noted the key phrase is "before mounting in the final system". Thus the cited passage teaches that a

passivation layer may be desirable before mounting in a final system. Further, at least one of the references cited by applicant indicates that there are situations where a detector without a passivation layer is desirable (e.g., see "Because of this effect, coated devices are limited to a maximum operating temperature of about 120°K (for  $10^{-9}$  A leakage) for high resolution spectroscopy, whereas a comparable bare device could be operated at 160°K if surface contamination can be avoided" in the second paragraph of the right column on pg. 250 of Hansen *et al.*). Thus a bare device can be operated at a higher temperature as compared with a passivated device. Therefore after mounting in a final system, a bare device offers the advantage of higher operational temperature as compared with a passivated device. Thus the secondary function (*i.e.*, passivation) of the sputtered a-Ge of the Luke *et al.* reference may not be desirable if one of the goals is a higher operational temperature. In addition, the Hamacher *et al.* reference clearly illustrates (see Fig. 1) a HPGe detector without a passivation layer. Additionally, the Luke *et al.* reference teaches (see introduction) that sputtered a-Ge contacts can be used as blocking contacts (*i.e.*, the primary function) on Ge radiation detectors with potential advantageous over conventional contacts (e.g., typical contacts formed by boron ion implantation). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide an undoped amorphous germanium layer instead of the boron doped layer in the detector of Hamacher *et al.*, in order to obtain good bipolar blocking contacts.



***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

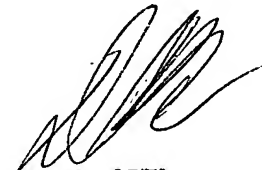
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (571) 272-2439. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2884

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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